

Advanced Capacitors for High-Power Applications, Phase I

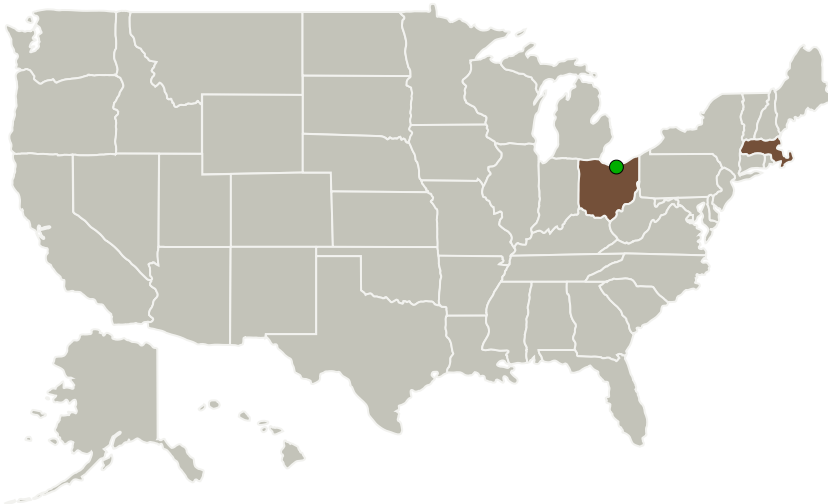
Completed Technology Project (2011 - 2011)



Project Introduction

As the consumer and industrial requirements for compact, high-power-density, electrical power systems grow substantially over the next decade; there will be a significant need for novel electrode/electrolyte materials for high-power/energy-density capacitors. To meet the strong market demand for miniaturization and higher capacitance/voltage values in a given case size, new and advanced technologies must be developed and implemented. This proposal addresses the development of an all-solid, high-energy-density, high-power-density, high-voltage capacitor, with substantially reduced Equivalent Series Resistance (ESR) and cost. The proposed capacitor combines the advantages of operating voltage associated with certain metal-oxide electrolytic capacitors with some special features of metal-oxide pseudocapacitor material. Compared to the standard solid electrolytic capacitor, the proposed capacitor design will have a higher capacitance and lower resistance, yielding a low-cost, low-ESR device with a simplified packaging process. During Phase I prototype capacitor units will be fabricated and characterized to demonstrate the feasibility of our approach. These units will be evaluated and compared to standard capacitors to evaluate the overall benefit of the hybrid capacitors and success in demonstrating concept feasibility.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Giner, Inc.	Lead Organization	Industry	Newton, Massachusetts
● Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations	
Massachusetts	Ohio

Project Transitions

February 2011: Project Start

September 2011: Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/137953>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Giner, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

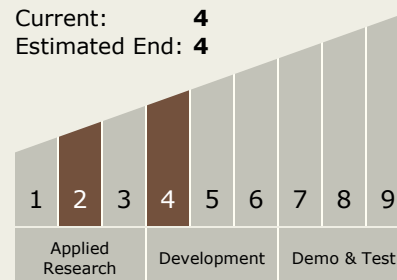
Carlos Torrez

Principal Investigator:

Badawi M Dweik

Technology Maturity (TRL)

Start: 2
Current: 4
Estimated End: 4



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Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
 - └ TX03.2 Energy Storage
 - └ TX03.2.2 Electrochemical: Fuel Cells

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System